SIARETRON 4000 ICU

Intensive care ventilator

code: 960401 gas driven

- Adults, Paediatric, Newborns -

rev. 5 - 01/09/2013

Main characteristics	The Siaretron 4000 electronic lung ventilator is equipped with a TFT 12” colour monitor displaying the curves of pressure, flow, volume, the loops of breathing parameters, the trends and the ventilatory parameters. The ventilator is suitable for ventilation of adult, paediatric and neonatal patients. It is equipped with a flow and pressure trigger, it provides the most advanced volume controlled ventilation modalities (VC/VAC, VC/VAC-BABY), pressure controlled ventilation modalities (APCV, APCV-TV), SIMV by Volume and by Pressure, Pressure supported modalities (PSV, PSV-TV), CPAP, BILEVEL S-ST, SIGH, Non Invasive Ventilation (NIV), Drug Nebulizer and Manual Ventilation (MAN). Siaretron 4000 is supplied with back up long lasting batteries and its software can be updated for new modes and last generation ventilatory strategies. Optional: Medical air compressor for trolley mounting.

TECHNICAL DATA	
Dimensions	Ventilator unit 518 x 535 x 269 mm (W x H x D) Ventilator unit and trolley 555 x 1207 x 554 mm (W x H x D)
Weight	Ventilator unit 14 Kg Ventilator unit and trolley 25 Kg
Relative Humidity (use)	30 – 95% RH
Working temperature	From 10 to 40 °C
Automatic compensation of atmospheric pressure on measured pressure	Present

OPERATION DATA	
Use destination	High performance Intensive care ventilator for adults, children and newborns with colour TFT at 12”.
Operation principle	• Time cycled at constant volume • Pressure cycled • Microprocessor controlled flow • Spontaneous breath with integrated valve
Ventilation modalities	VC/VAC, VC/VAC BABY, APCV (BILEVEL ST), APCV-TV, P SIMV+PS, V SIMV+PS, SPONT, PSV (BILEVEL S), PSV-TV (Auto Weaning), APRV, CPAP, SIGH, NEB, Apnoea BACK-UP, NIV, MANUAL.
Breathing rate	From 5 to 150 bpm
Inspiratory Time; Expiratory Time (maximum, minimum)	• Ti min = 0.036sec (minimum inspiratory time) • Ti max = 9.6sec (maximum inspiratory time) • Te min = 0.08sec (minimum expiratory time) • Te max = 10,9sec (maximum expiratory time)
SIMV Breathing rate	From 0 to Rate -1 (Rate -1)
SIMV Inspiratory time	From 0.2 to 4.0 sec.
Tidal volume	from 2 to 3000 ml (from 2 to 100 ml in VC/VAC BABY mode)
I:E ratio	From 1:10 to 4:1
Inspiratory pause	From 0 to 60 % of the inspiratory time
Inspiratory pressure limit	From 2 to 80 cmH_2O
PEEP	From OFF to 50 cmH_2O
O_2 concentration	Adjustable from 21 to 100% with electronic integrated mixer
Trigger I	• Pressure trigger: adjustable from OFF; -1 to -20 cmH_2O under PEEP level • Flow trigger: adjustable from OFF; 0.3 to 15 l/min
Trigger E	From 5 to 90 % of the inspiratory flow peak
Trigger detective method	Through sensor (pressure or flow)
Max. inspiratory flow	240 l/min.
Flow-by	2 l/min + Flow Trigger

Leakage compensation	In NIV mode
SIGH	Interval : 40 ÷ 500 bpm (step 1) Amplitude : OFF, 10 ÷ 100% of set Tidal Volume (step 10)
APRV	Time 1 and Time 2 : from 10 to 200 sec. Level 1 and Level 2 : from 3 to 30 cmH_2O.
CPAP	From 3 to 30 cmH_2O
NEB	Drug nebulizer: selectable to 6 l/min with automatic compensation on forced ventilation modes and dedicated output
Supply pressure	O_2 - Aria: pressure included between 280 kPa and 600 kPa (2,8 - 6 bar) Max flow requested from ventilator: 120 l/min
Patient circuit	Double-hose, non rebreathing
Other controls	• INSP Block and EXP Block (max. 20 seconds) • Button 100% O2 x 5 min • MAN control (manual ventilation) • Loops e Curves selection
Other features	External alarm / Nurse call
Expandability	Software upgradeable for future modalities
Dead space compensation	Automatic compensation of mechanical and patient circuit dead space
MONITORING AND USER INTERFACE	
12” TFT colour display	The display allows: • Setting of Operative Mode • Visualization of alarm messages and signals • Setting and monitoring of physiological breathing parameters • Visualization of additional graphs and breathing parameters • The function MENU for setting operation parameters • Activation of special functions • Visualization of operative mode, clock, date and time functions • Visualization of software version

Display keyboard	Lateral keyboard for rapid access of functions. Encoder knob for: • selection, set up and confirmation of physiological breathing parameters • selection and direct activation of function
Set physiological breathing parameters (SET)	FLOW (L/min), FR (bpm), FRsimv (bpm), I:E, Pausa (%), PEEP (cmH_2O), PLIM (cmH_2O), PMax (cmH2O), PS (cmH_2O), SIMV RATE (bpm), Ti (s), Ti max (s), Ti min (s), Trig. E (%), Trig. I (L/min), Vte (ml), Vti (ml), O_2 (%), SIGH (% - bpm), CPAP (cmH_2O), APRV (sec. - cmH_2O), BACK-UP parameters
MENU function (settings)	• SETUP adjustments • Alarms • Trends • Events • Patient data • Default parameters
SETUP function (settings)	• Language • Graphic • Volume • Energy saving • Brightness • Apnoea time • Gas sensor N_2O : unit of measurement • Password • TCP setting • Technical contact • Test on demand • Gas sensor • Colour selection

Measured parameters	• PAW: peak, mean, plateau, PEEP (range -20 ÷ 80 cmH_2O) • Tinsp., Texp, Tpause (range 0.036 ÷ 10,9sec) • I:E ratio (range 1:99 ÷ 99:1) • Static and dynamic compliance (range: 10 ÷ 150 ml/cmH_2O) • Resistance (range: 0 ÷ 400 cmH_2O/l/s) • % of FiO_2 (range: 0% ÷ 99%) • Rate (range: 0 ÷ 150 bpm) • Tidal Volume: Vte, Vti (range: 0 ÷ 3000 ml) • Minute Volume (range: 0 ÷ 40 l/min) • Inspiratory Peak Flow (range: 1 ÷ 200 l/min) • Expiratory Peak Flow (range: 1 ÷ 150 l/min) • $EtCO_2$: with optional CO_2 module (range: 0 ÷ 10%)
Additional measured parameters	MAP (cmH_2O), Pplateau (cmH_2O), Fi (L/min), Fe (L/min), Ti (sec.), Te (sec.) Tpause (sec.), Ri (cmH_2O/L/sec.), Cs (ml/cmH_2O)
Displayed graphics	• CURVES: Pressure - Flow - Volume - (CO_2 optional) • LOOPS : Pressure / Volume - Flow / Volume - Pressure/Flow • Auto range
Trends	Storage capacity (72 h) of all measured parameters.
Events	Memory storage up to 100 machine events including the alarms.
Flow sensor	• Magnetic perturbance (patented), multi-usage • Automatic flow sensor calibration (started by the operator) • Steam or chemical disinfection
Oxymeter	Electronic with automatic calibration.
CO_2 module (optional)	CO_2 module (main-stream or side-stream)

ALARMS	
Alarm types	With limits set by the operator
	By default: the operator cannot set them up
Alarm priority	High - Mean - Standby
Alarms with limits set up by the operator	
Airways pressure	High – Low
Breathing rate	High – Low
Expired Minute Volume	High – Low
Expired Tidal Volume	High – Low
FiO_2 concentration	High – Low
PEEP	High – Low
Electric power supply	Alarm occurs in case of failure of external power supply
Apnoea	Low Rate (function of Apnoea BACK-UP)
$EtCO_2$	High – Low (with optional CO_2 module)
System alarms	
Level (charge)	Battery at 50%
Level (charge)	Battery at 25%
Battery Level (low)	10 Minutes
Gas feeding: O_2	Low (< 2,7 bar)
Gas feeding: Air	Low (< 2,7 bar)
CAN BUS error	Electronic boards CAN connection wrong
Maintenance	1000 hours
SELF-TEST alarms	
Gas supply	Verification of the presence of Air and O_2 supply pressure
EXP.- INSP. Flow sensor	Verification of EXP flow sensor operation
Airways pressure sensor	Verification of pressure sensor operation through control of PAW reading
Patient circuit	Verification of patient circuit
Battery	Checking on battery power

Oxygen cell	Cell condition
Acoustic alarm	Verification by the user of acoustic signal emission, the confirmation of the test is made by silencing of that alarm

POWER SUPPLY	
Electric power supply	100-230 Vac 50-60Hz / 12 Vdc with external auxiliary battery
Power	120 Watt
Internal power supply	12 Vdc / 4,5 Ah
Internal battery operation	1,5 hours max. (Optional external battery 8 hours max)
Re-charging time	About 8 hours
External connections	RS232 for CO_2 module or PC (transfer patient data, events and trends - optional)

CAPNOMETRY (optional)	
Capnometry connection	Available: CO_2
Measuring mode	Mainstream or Sidestream
General specifications	See on relative Multigas Analyzer Modules for technical data sheet

CONFORMITY TO NORMS	
ISO 5369, EN 1281-1, IEC 601-1, IEC 601-1-2, Directive 93/42 EEC, EN 4135, IEC 601-1-4, NF S 90-118, EN 794-1, UNI CEI ISO 14971, UNI EN 475, UNI EN ISO 9703-3.	
Class and type according to IEC 601-1	Class 1 Type B
Class according to 93/42 EEC Directive	Class IIb

ACCESSORIES

Supplied Accessories	• User's Manual • O_2 supply hose • AIR supply hose • Nebulizer set • Silicone patient circuit • Antibacterial filter • Power cable, SHUKO-VDE • O_2 cell
Optional Accessories	See on Export Price List

SIARE applies the UNI EN ISO 13485:2004 Quality System and the 93/42 EEC.

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